Reporting the Impact of Inferior Vena Cava Perforation By Filters

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Background: Perforation of the inferior vena cava (IVC) and its surrounding structures by filter struts is a known complication. The goal of our review is to gauge the impact of IVC perforation by filters based on a 'real world' open database provided by users, facilities and manufacturers.

Methods: We reviewed 3,123 adverse events of IVC filters reported in the Food and Drug Administration MAUDE (Manufacturer and User Facility Device Experience) database from January 2000 to June 2011. Outcomes of interest were incidence of IVC perforation, type of filter, clinical presentation, and management of the perforation, including irretrievability rates.

Results: Three hundred sixty-seven cases of IVC perforation (12%) were reported. The annual distribution of IVC perforation was 32 (11%) cases, varying from 7 (6%) to 70 (17%). A three-fold increase in the number of adverse events related to IVC filters has been noted since 2004; however, the accrual numbers of IVC perforation have not significantly changed over the years (Graph 1). The most common IVC filter involved in IVC perforation was the Bard G2 Filter Platform System (225, 61%), followed by the Cook Celect in 38 cases (10%). Vein wall perforation as an incidental finding was the most common presentation described in 171 (47%) patients. Surrounding organ involvement was found in 121 (33%) cases, with the aorta involved in 40 (33%) and the duodenum in 26 (21%) cases. The filter retrieval rate was 84% regardless of vein wall perforation. Forty (11%) cases required an open procedure to remove the filter due to either multi-organ involvement or a failed attempt at retrieval. Neither major bleeding requiring further intervention nor mortality was reported secondary to filter retrieval.

Conclusions: IVC perforations by filters remain stable over the past decade despite increasing numbers of adverse events reported. The majority of filters involved in perforation were retrievable and had a multi-prong design for better attachment to the vein wall. Endovascular filter retrieval, regardless of IVC wall perforation, is feasible and must be attempted as it is associated with a higher success rate, and no mortality or major bleeding events have been reported.

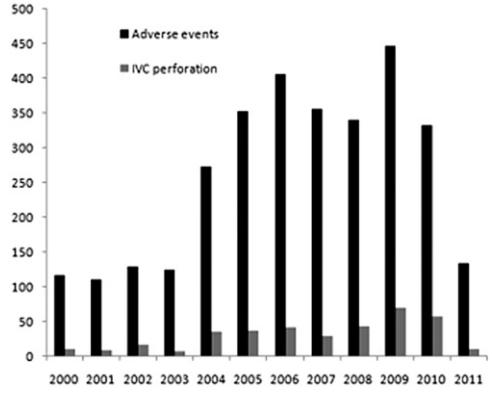

Fig.

Factors Increasing Risk of Venous Thromboembolism After Arterial Reconstructive Procedures

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Background: Although the incidence of venous thromboembolic events (VTE) after common vascular surgical procedures repair is low, we hypothesize that the risk of VTE may be higher in an identifiable subset of patients. These patients may benefit from appropriate measures to prevent VTE. To date, no study has examined and/or elucidated this issue.

Methods: The National Inpatient Survey (NIS) database from years 2000-2009 was reviewed. Records of patients who underwent open repair of an intact abdominal aortic aneurysm (AAA), carotid endarterectomy (CEA) aortobifemoral bypass for occlusive disease (ABF) and infrainguinal bypass (BPG) were crossed with appropriate diagnoses for those operations. The outcome variable evaluated was the development of VTE (deep vein thrombosis (DVT) or pulmonary embolism (PE)) as specified by the International Classification of Diseases, 9th revision (ICD-9; DVT 453.4 and PE acute and postoperative 415.19and 415.11, respectively). Perioperative and hospital complications were grouped into five families (intestinal, pulmonary, urinary, infectious and cardiac). Prior patient histories of VTE and a history of coagulopathy were also examined. Multivariate analysis of common complications and the association of these complications with the frequency of VTE were conducted. Chi-squared statistics were calculated. For all analyses, $p < .05$ was considered significant.

Results: The total number of discharges containing one of the procedures of interest was 750,659. Table I details the number of discharges and the incidence of VTE for each of the procedures. All the complications we assessed, except for cardiac, were more associated with patients who developed VTE. For all procedures, the combined end point of VTE was statistically more likely in patients with pulmonary, urinary, infectious complications or had a history of VTE or a history of coagulopathy. For all procedures, cardiac complication did not show an association with the development of VTE. Intestinal complications were associated with VTE development in patients undergoing AAA or femdistal bypasses, but not CEA or ABF.

Conclusions: The overall rate of VTE in patients undergoing common vascular surgical procedures is quite low. We have a difference in VTE risk based on complications that occur during the hospital stay. The observation of the low incidence of VTE in patients with cardiac complications may be due to anticoagulation of patients with cardiac complications. This data suggests we should consider anticoagulation in patients with multiple perioperative complications.

Table I. Frequency of procedures and percentage with VTE

Diagnosis	*n*	*%VTE*
AAA	73,545	0.34
CEA	373,465	0.06
ABF	50,415	0.27
BPG	253,234	0.31

Strategy of Thrombus Removal For Extensive DVT of Pregnancy

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Background: Extensive deep vein thrombosis (DVT) is associated with severe postthrombotic morbidity when treated with anticoagulation alone. Extensive DVT during pregnancy is usually treated with anticoagulation alone, risking significant postthrombotic morbidity. Thrombolytic therapy and operative venous thrombectomy have been safely and effectively used in selected pregnant patients. The purpose of this report is to review the short and long-term outcomes of eleven patients with extensive DVT of pregnancy treated with a strategy of thrombus removal.

Methods: From 1999-2011, eleven patients were referred for management of extensive DVT during pregnancy, ten patients with iliofemoral/caval DVT and one with acute superior vena caval syndrome. Gestational age ranged from 8 to 36 weeks. All patients were offered a strategy of thrombus removal including catheter-directed thrombolysis, pharmacomechanical thrombolysis (PMT), and/or operative venous thrombectomy. Fetal monitoring was performed throughout hospitalization. Radiation exposure was minimized by using pelvic lead shields, limiting fluoroscopy, using small visual fields, hand held contrast injections and avoiding magnified views. Following intervention, leg compression was applied, patients were anticoagulated with heparin and ambulated. Patients were converted to vitamin K antagonists after delivery. Follow up included objective evaluation using venous duplex and the Villalta scale.

Results: Catheter-directed thrombolysis and PMT were used in nine patients. Two patients declined thrombolytic therapy but agreed to venous thrombectomy, and one patient had operative thrombectomy as an adjunct to PMT. Each patient had complete or near complete thrombus resolution and rapid improvement in clinical symptoms. Eight patients delivered healthy infants at term; two are currently in their third trimester, one suffered an in-utero death 5 days post lysis due to her antiphospholipid antibody syndrome. One patient developed two major complications, gross hematuria requiring blood transfusion and a left popliteal artery pseudoaneurysm that resolved with compression ultrasound. Mean follow up was 2 years, without evidence of recurrence. Three patients had uneventful subsequent pregnancies. Venous duplex ultrasonography demonstrated patent veins and normal valve function in 8 patients. Of the 10 patients with iliofemoral DVT, 9 had Villalta scores <4, and one patient had a score of 5, consistent with mild postthrombotic syndrome.

Conclusions: Extensive DVT of pregnancy can be effectively and safely treated with a strategy of thrombus removal, resulting in a patent venous system with normal valve function, prevention of postthrombotic morbidity, and reduction in recurrence. Operative and catheter-based techniques can be tailored to the patient.

Value of Postoperative Compression After Surgical Treatment of Varicose Veins

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Background: It is customary to recommend wearing of elastic band compression or compression stocking after treatment of varicose veins. We wanted to learn through this study the benefit of wearing elastic compression after surgical treatment of varicose veins (VVs).

Methods: We have prospectively included all patients operated on for unilateral VVs, and distributing them into two groups: Group 1: putting on a class 2 stocking (18 mmHg) from the operating day until the postoperative consultation (approximately 8 days afterwards). Group 2: putting on a class 2 stocking (18 mmHg) from the operating day until the following day (D1) when it is removed.

Results: One hundred patients were included in the study, in equal proportion (50) between group 1 and group 2. The study of the demographic, clinical and hemodynamic characteristics, show no significant difference between the two groups. All the surgical procedures had been carried out under tumescent local anesthesia, in short ambulatory. The procedures carried out were not significantly different between group 1 and group 2, and had been most frequently phlebectomy with conservation of the refluxing saphenous vein (ASVAL) (46% vs. 48%). The patients all returned to postoperative consultation (on average 10.0 days on average for group 1 and 9.4 days group 2, nonsignificant: NS) for evaluation. The average pain score (visual analog scale: VAS) was not significantly different between group 1 and group 2 (0.6 vs. 0.8). The self-evaluation by VAS of the size of ecchymoses reported an average score without significant difference between groups 1 and 2 (1.3 vs. 1.2). The circumference of the ankle measured was not significantly different between the operated limb and the contralateral limb, for group 1 (26.2 cm vs. 25.9 cm) as well as for group 2 (26.2 cm vs. 26.0 cm). The measurement of the quality of life by the CIVIQ questionnaire found an average score of 7.00 in group 1 vs. 8.64 in group 2 (NS). Superficial or deep vein thrombosis was not found in any case. Lastly, 73.3% of the patients in group 1 and 67.7% of the patients in group 2 (NS) did not have sick leave, and the average sick leave was, respectively, 2.6 and 2.3 days in group 1 and 2 (NS).

Conclusions: We found no value of wearing the compression after a surgical treatment of the varicose veins beyond the 1st postoperative day for pain, ecchymoses and the quality of life after the procedure. These results were obtained in the context of a mini-invasive surgery carried out under tumescent local anesthesia with immediate ambulation.

Contemporary Results Following Saphenopopliteal Transposition For Chronic Femoral Vein Occlusion

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Background: Chronic occlusion of the femoral or the proximal popliteal vein responsible for venous insufficiency and the constellation of clinical sequelae that ensue remains a surgical challenge that carries notable patient morbidity and the threat of potential limb loss. Saphenopopliteal bypass remains a surgical reconstructive option for select patients that demonstrate patency of the popliteal vein, greater saphenous vein, saphenofemoral junction and pelvic veins. We sought to analyze our single-institution experience with this technique.

Methods: A retrospective review of a single-center experience with saphenopopliteal transposition was performed. Preoperative risk factors and indications for intervention (ie: symptomatology including tissue loss) were identified. Duration of follow-up and end-points including clinical improvement, wound healing, patency and limb loss were assessed. A Kaplan-Meier analysis for patency was performed.

Results: Seventeen patients underwent a saphenopopliteal bypass for chronic lower extremity venous obstruction between July, 1988 and August, 2011. Median age at operation was 40 years (range, 23-69 years). There was a male predominance noted (N=12; 71%). All patients suffered from chronic edema and venous claudication. Six patients (35%) had evidence of venous ulceration preoperatively. Seven patients (41%) underwent a preceding venous intervention (ie: iliac stenting or venous thrombolysis). Three patients had a concomitant arteriovenous fistula created to enhance in-flow; two patients underwent concomitant femoral-femoral venous bypass. Five patients (29%) experienced hematoma postoperatively that required operative evacuation; in two patients compression from this hematoma resulted in early graft occlusion. After a median follow-up of 85 months (range, 2-236), 82% of patients experienced symptom improvement or near-complete symptom resolution. Four of the six patients with venous ulceration healed their wounds (67%). Of the sixteen patients that underwent Duplex follow-up, primary patency was 68.7% and secondary patency was 75%. (Fig) One patient required amputation and there were no deaths. This secondary patency rate exceeds any previously published patency rate.

Conclusions: Saphenopopliteal bypass is indicated for chronic venous stasis disease secondary to deep venous obstruction at the thigh. This venous reconstruction option remains a satisfactory and reliable procedure that produces clinical improvement in a selected group of patients and should be considered in a contemporary venous surgical practice.

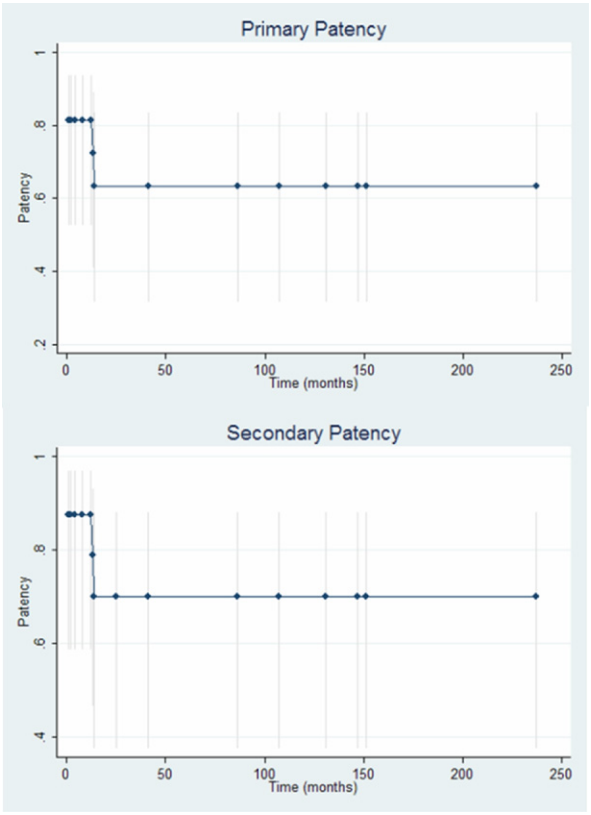

Fig.

Liberation Procedure in the Treatment of Chronic Cerebro-Spinal Venous Insufficiency - Is Chronic Cerebro-Spinal Venous Insufficiency Related To Brain Congestive Syndrome Rather Than Multiple Sclerosis

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Background: Chronic cerebro-spinal venous insufficiency (CCSVI) is a term developed to describe compromised flow of blood in the veins draining the central nervous system. It has been suggested by some authors that this condition is related to Multiple Sclerosis (MS). Balloon angioplasty and stenting have been proposed as a treatment option for CCSVI in MS. The proposed treatment has been termed "liberation procedure" though the name has been criticized for suggesting unrealistic results.

Methods: An open,prospective,single-center study, was performed in order to determine the efficacy of "Liberation procedure" in the treatment of different forms of MS (relapsing remitting,secondary progressive, primary progressive, and progressive relapsing). The evaluation of patient's status before the procedure, 6 and 12 months after the procedure was performed using: Expanded Disability Status Scale (EDSS); MSFC-Multiple sclerosis functional composite(TIMED 25-FOOT WALK;9-HOLE PEG TEST;PASAT-Paced auditory serial test) and SDMT-Symbol digit modalities test. The outcome of the procedure was also analyzed using: PRO-patient related outcomes, SF-36 questionnaire,EQ-5D (EuroQol) and Functional Assessment of Multiple Sclerosis (FAMS) quality of life. In order to determine the effects of the procedure blood sample from jugular vein was analyzed 24h before the procedure and 24h, 72h and 7 days after the procedure (pH and bicarbonate, BE, pCO2 and pO2, K+, Na+, CRP).

Results: Overall 205 patients completed the study (86 men and 119 women). Ninety-two patients had relapsing-remitting MS, 103 patients had secondary progressive form and 10 patients had primary progressive MS. Avarage patient's age was 41.21years. The EDSS before the "Liberation procedure" was 5.502±1.95 (visual-0.24±0.71;brainstem-1.06±1.29; pyramidal-3.1±1.16;cerebellar-2.0±0.99; sensory-2.64±0.72; bowel/bladder- 1.14±0.87; cerebral −0.87±1.17). On the check-up 6 and 12 months after the procedure the EDSS did not show any statistical significant difference between the pre and post procedural values. However, initial benefit of the procedure was seen in almost 70%